

# Kent Academic Repository

## Full text document (pdf)

### Citation for published version

Alleyne, Emma (2018) Factors that distinguish aggression towards animals from other antisocial behaviors: Evidence from a community sample. *Aggressive Behavior*. ISSN 0096-140X.

### DOI

<https://doi.org/10.1002/ab.21768>

### Link to record in KAR

<http://kar.kent.ac.uk/66785/>

### Document Version

Author's Accepted Manuscript

#### Copyright & reuse

Content in the Kent Academic Repository is made available for research purposes. Unless otherwise stated all content is protected by copyright and in the absence of an open licence (eg Creative Commons), permissions for further reuse of content should be sought from the publisher, author or other copyright holder.

#### Versions of research

The version in the Kent Academic Repository may differ from the final published version.

Users are advised to check <http://kar.kent.ac.uk> for the status of the paper. **Users should always cite the published version of record.**

#### Enquiries

For any further enquiries regarding the licence status of this document, please contact:

[researchsupport@kent.ac.uk](mailto:researchsupport@kent.ac.uk)

If you believe this document infringes copyright then please contact the KAR admin team with the take-down information provided at <http://kar.kent.ac.uk/contact.html>

**Factors that Distinguish Aggression Towards Animals from other Antisocial Behaviors:  
Evidence from a Community Sample**

Emma Alleyne and Charlotte Parfitt

School of Psychology

University of Kent

Author Note

Charlotte Parfitt, Emma Alleyne, Centre of Research and Education in Forensic Psychology, School of Psychology, University of Kent, Canterbury, Kent, England.

Correspondence concerning this paper should be addressed to Emma Alleyne, Centre of Research and Education in Forensic Psychology, School of Psychology, University of Kent, Canterbury, Kent, CT2 7NP. Email: [E.K.A.Alleyne@kent.ac.uk](mailto:E.K.A.Alleyne@kent.ac.uk)

**Please cite as:** Alleyne, E., & Parfitt, C. (in press). Factors that distinguish aggression towards animals from other antisocial behaviors: Evidence from a community sample. *Aggressive Behavior*.

### **Abstract**

Animal cruelty is a form of passive and active aggression that is largely undocumented and unreported. Given that animals are voiceless victims, we have to rely on witnesses and frontline staff (e.g., veterinarians) to report incidents of abuse, which suggests the number of convicted animal abusers is an under-representation of actual perpetrators. The primary aim of the current study was to identify the static and dynamic factors that distinguish animal abusers from non-abuse offenders (i.e., individuals who self-reported antisocial behavior, but not animal abuse), and non-offenders (i.e., individuals who have not engaged in any antisocial behavior) in a community sample. The secondary aim was to identify the potential pathways that distinguish animal abuse perpetration from other types of antisocial behavior. Three hundred and eighty four participants took part in this retrospective, correlational study. We found that animal abusers share similar socio-demographic characteristics to other offenders but are distinct in their exposure to animal harm/killing during childhood. Low animal-oriented empathy and low self-esteem distinguished animal abusers from non-abuse offenders when controlling for confound variables and other psychological characteristics. We also found that low animal-oriented empathy mediated the relationship between childhood exposure to animal killing and animal abuse perpetration, and that this relationship was stronger amongst participants with anger regulation issues. This is the first study to examine similarities and differences between animal abusers, non-abuse offenders, and non-offenders on socio-demographic and psychological characteristics. The findings highlight potential treatment targets that are unique to animal abusers with implications for prevention and intervention strategies.

**Keywords:** animal abuse, animal cruelty, adult perpetrators, offending behavior, victim empathy

## **Factors that Distinguish Aggression Towards Animals from other Antisocial Behaviors:**

### **Evidence from a Community Sample**

Although we understand much about why adults are violent towards each other, little research exists on what predicts and facilitates harmful behavior towards animals. Animal abuse – defined as “all socially unacceptable behavior that intentionally causes unnecessary pain, suffering or distress and/or death to an animal” (Ascione, 1993, p. 83) – is a form of aggression (both passive and active) consisting of emotional, psychological, physical abuse, and neglect. Animal abuse causes suffering not only to its victims, but also, oftentimes, other household members forced to witness or condone it (Allen, Gallagher, & Jones, 2006; Flynn, 2000a; Flynn, 2000b). Most importantly, this link between animal abuse and interpersonal violence is pertinent to early intervention for child abuse and domestic violence (Faver & Strand, 2003; Hackett & Uprichard, 2007).

Some argue that animal abuse is an opportunity to rehearse for future acts of human-directed aggression (e.g., Ascione, 2005; Merz-Perez & Heide, 2004), although evidence for cause and effect is limited and often based on retrospective reports. However, there are consistent findings that animal abusers are generally antisocial (in support of the deviance generalization hypothesis; Arluke, Levin, Luke, & Ascione, 1999; Green, 2002). Further, animal abusers typically commit more antisocial behavior than non-abusers (Arluke et al., 1999; Henry, 2004a, 2004b; Schwartz, Fremouw, Schenk, & Ragatz, 2012; Vaughn et al., 2009), but we do not know whether abusers hold unique characteristics that facilitate harmful behavior towards animals over and above what a non-abuser offender would hold. The aim of the current study is two-fold: (1) to identify the static and dynamic factors that distinguish animal abusers, non-abuser offenders (i.e., individuals who engage in other types of antisocial behavior), and non-offenders (i.e., individuals who have not engaged in any antisocial

behavior); and (2) to examine the links between past experiences, psychological sequelae, and animal abuse perpetration.

### **Developmental Context of Animal Abusers**

The general and violent offending literature does point to the importance of understanding how experiences during child development impact on psychological functioning, which then facilitates the production of aggressive and antisocial behavior. Given that animal abuse behavior co-occurs with non-violent as much as violent behavior (see Walters, 2013, for a meta-analysis), it remains unclear whether animal abusers have childhood experiences that are distinct from those of other types of offenders. We know that there is a broad relationship between childhood adversities (i.e., family substance abuse, family incarceration, neglect, emotional, physical, and sexual abuse) and lifetime prevalence of animal abuse. For example, when controlling for confounds<sup>1</sup>, Vaughn et al. (2011) found that verbal abuse and sexual abuse from a parent or other caregiver/adult and having a parent or other caregiver/adult who was incarcerated, were related to animal abuse perpetration. They also found no cumulative effect with each negative experience. So, they argued that animal abusers possessed callous traits that were more heritably than environmentally derived; or at minimum, less susceptible to environmental influences. However, Vaughn et al. (2011) acknowledge that their assessment of animal abuse perpetration was not nuanced enough to capture age of onset and/or recurrent behavior.

In a series of studies, Henry found that in addition to being male, mere exposure to animal abuse (i.e. witnessing acts of animal abuse that include killing, torture, and threats of harm, and also, forced participation in animal abuse) prior to the age of 13 (Henry, 2004a, 2004b) and sexual abuse experiences during childhood (Henry, 2006) were significant

---

<sup>1</sup> Analyses controlled for: gender, marital status, education attainment, income level, and country of birth, age, and psychiatric diagnoses – but not racial and ethnic differences

predictors of animal abuse perpetration. These findings highlight animal abuse as a potential mechanism or strategy for coping with traumatic experiences during childhood. However, similar to Vaughn et al. (2011), Henry assessed lifetime prevalence of animal abuse perpetration, therefore, the causal relationship is yet to be evidenced. Although the data cannot evidence this directly, it can be argued that the link between animal abuse exposure and perpetration might be explained by a potential cumulative effect of witnessing animal abuse and child abuse experiences on socio-psychological constructs such as empathy and moral development. This has yet to be tested.

### **Empathy, Callousness, and Animal Abuse**

Empathy – defined as “the ability to understand and share in another’s emotional state or context” (Cohen & Strayer, 1996, p. 988) – is a construct comprising cognitive and emotional components. Lack of empathy has a substantiated link with antisocial behavior and delinquency (Joliffe & Farrington, 2004). What is of particular interest is that Joliffe and Farrington (2004) found a stronger relationship between empathy deficits and generalist offending (i.e., engagement in various types of offending) than between empathy deficits and specialist offending (in this instance, sexual offenders). This finding suggests that empathy (or lack thereof) may act as a disinhibitor for someone offending across varied contexts, but in specialized circumstances, there may be additional factors that over-ride the effect of empathy (e.g., the process of goal formation to achievement in sexual grooming; Elliott, 2017). Theoretically speaking, since empathy deficits are linked to generalist offending, and there is evidence that animal abuse is typically part of a broader repertoire of offending (e.g., Walters, 2013), whether empathy facilitates cruelty towards animals remains to be explored.

We know that low levels of empathy are related to negative attitudes towards the treatment of animals (Erlanger & Tsytsarev, 2012), animal abuse proclivity (Alleyne, Tilston, Parfitt, & Butcher, 2015), and behavior (Gupta, 2008). To date, most of the research (Gupta

being the exception) has focussed on the relationship between animal abuse and human-human empathy with the implied argument that animal abuse is a form of rehearsal for later human-directed violence (e.g., violence graduation hypothesis; Arluke et al., 1999; Wright & Hensley, 2003). However, as mentioned previously, there is growing evidence to the contrary whereby animal abusers are more generalist than (violent) specialists (Walters, 2013). This suggests further complexities in the nature and scope of the relationship between empathy and animal abuse.

Gupta (2008) conducted the only study to date that not only examined human-directed callous traits, but also animal-directed callous traits. She found that both types of callousness correlated with animal abuse. However, it remains unclear whether one type is more important than the other in distinguishing animal abusers (especially when compared to other types of offenders where low human-human empathy is expected). What is apparent is that low empathy has a direct effect on the likelihood of animal abuse (Agnew, 1998), but what has yet to be examined is whether other social-psychological factors play facilitative roles.

### **Self-Concept, Regulatory Processes, and Animal Abuse**

How we perceive and interact with others is also a reflection of our self-appraisals and evaluations. For example, self-esteem forms part of a regulatory system, a sociometer (Fiske & Taylor, 2013). This sociometer acts as a self-monitoring (or, rather, self-referencing) system that gauges a person's relational value to others, and if this value is threatened, the person acts to protect it (Leary & Guadagno, 2011). Both low (e.g., Donnellan et al., 2005; Garofalo, Holden, Zeigler-Hill, & Velotti, 2016) and high (e.g., Bushman, Baumeister, Thomaes, Ryu, Begeer, & West, 2009) self-esteem have been linked to aggression. This suggests that self-esteem impacts on which strategies we choose to employ in order to regulate our feelings of worth (i.e., self-enhancement versus self-protection; Zeigler-Hill, Dahlen, & Madson, 2017).

Animal abuse has been most studied within the context of intimate partner violence (see Alleyne & Parfitt, in press, for review). Example motivations for perpetrating this type of abuse include: to demonstrate power over their partner (sometimes by forcing their partner to perpetrate the animal abuse); to isolate their partner from sources of support and respite; an expression of anger and rage for perceived slights from their partner; and to pre-empt their partner leaving (Adams, 1995). These motivations could be, for example, captured within the construct locus of control. Gupta (2008) found that callousness was associated with instrumental (i.e., 'taking control') rather than expressive (i.e., 'losing control') representations of aggression amongst animal abusers, but these underlying motivations also suggest that perpetrators are reacting to perceived threats to their self-worth. However, we are not entirely sure whether the perpetrators are reacting due to low or high self-esteem, and we certainly do not know whether self-esteem plays an equal role within and between the various contexts in which animal abuse is perpetrated. Most importantly, what appears to be emerging is the importance of regulatory processes in the perpetration of animal abuse. Howells, Watt, Hall and Baldwin (1997) found that both animal cruelty and interpersonal aggression are caused by heightened levels of intrapersonal aggression and poor anger regulation, adding the importance of emotion (presumably anger) management in the production of animal abuse.

### **Our Study**

In sum, there has yet to be a study to bring together a broader array of developmental and psychological vulnerabilities to investigate (1) whether they distinguish animal abusers from other types of offenders and non-offenders, and (2) whether the perpetration of animal abuse (when compared to other offenders) can be explained by a model of variables as implicated by the existing literature. Given the literature reviewed, we devised the following hypotheses:



H<sub>1</sub>: Animal abusers, like other offenders, would share similar demographic characteristics (i.e., age, gender, ethnicity) and childhood adverse experiences (such as physical and sexual abuse), and these two groups would differ from the non-offender group. Where we predict the two groups would differ would be in their background experiences of animal abuse, whereby animal abusers would have been exposed to some form of animal killing during childhood (e.g., witnessing animal abuse).

H<sub>2</sub>: Animal abusers and the offender comparison group would differ from the non-offender group across self- and other-appraisal variables (i.e., empathy [human- and animal-oriented], self-esteem, and locus of control), and self- and emotion-regulation variables (i.e., impulsiveness, anger regulation, and aggression). However, given what we know about animal abuse from the intimate partner violence context, we expected some differences between the offender groups; specifically, in animal-oriented empathy, self-esteem, and anger regulation.

H<sub>3</sub>: Animal-oriented empathy would play a unique and facilitative role in the perpetration of animal abuse. Specifically, the relationship between childhood animal abuse experiences and animal abuse perpetration would be explained by animal-oriented empathy.

## Method

### Participants

Participants were recruited via Amazon's Mechanical Turk (MTurk) where they were paid \$1.00USD compensation. MTurk is a valid, online crowdsourcing platform that enables cost-effective recruitment of diverse participant pools from the USA (Mason & Suri, 2012)<sup>2</sup>.

---

<sup>2</sup> MTurk enables access to a large participant pool that is in many ways more diverse and generalizable than other face-to-face samples and the quality of the data collected is on par with traditional methods (see Buhrmester, Kwang, & Gosling, 2011; Casler, Bickel, & Hackett, 2013). It should be noted that Miller et al. (2017) did find moderate differences between MTurk and clinical samples on various personality traits related to antisocial behavior (and they found no differences between MTurk and undergraduate samples). However, given that animal abuse is largely unreported, we wanted to recruit a community sample to potentially capture the wider range of animal abuse perpetrated (including abusers who may not have been detected) rather than limited to more severe/acute cases found in forensic/clinical samples.

We recruited a total of 400 participants to complete our study, of which 16 failed attention checks located throughout the survey. The remaining participants ( $N = 384$ ) were included in the analyses. The mean age of participants was 37.22 ( $SD = 11.26$ ; range = 19-71), and 51% were men. The majority of participants reported their ethnicity as White/Caucasian (84%), while the remaining were Black (7%), Asian (2%), and Other (7%).

## Measures

### Independent variable

Consistent with the study's hypotheses, the IV consisted of three groups: animal abusers, non-abusers who engaged in antisocial behavior, and non-offenders.

Animal abuse perpetration was assessed using the Aggression Towards Animals Scale (Gupta & Beach, 2001). The scale begins by asking participants "How often as an adult (since the age of 18) have you" followed by a series of items describing various forms of harmful behavior towards animals. We conducted a factor analysis of the scale and found a two factor solution. One of the factors (14 items) was characterized as abusive behavior towards animals (e.g., "Hit an animal with an object that could hurt?", "Deprived an animal of food, water, or medical care?"). The five items comprising the other factor were interpreted as potentially disciplinary practices rather than abuse (e.g., "Yelled at an animal?", "Intentionally intimidated an animal?"). As a result, we used the 14 items of the first factor in the analyses. Participants were asked to respond on a 7-point Likert-type scale (i.e., never, once, twice, 3-5 times, 6-10 times, 11-20 times, and more than 20 times). The scale demonstrated good internal consistency ( $\alpha = .88$ ).

Antisocial behavior was measured using the Illegal Behavior Checklist (McCoy, Fremouw, Tyner, Clegg, Johansson-Love, & Strunk, 2006), which consists of 22 items asking participants to respond yes/no to whether they have ever engaged in various types of antisocial behaviors. Example items include: "sold marijuana", "intentionally set fire to

destroy property that did not belong to you”, and “attacked someone with the intention of seriously hurting him or her”. The Cronbach’s alpha coefficient for the composite measure indicated good internal reliability ( $\alpha = .87$ ).

We trichotomized the data whereby animal abusers ( $n = 105$ ) were classed as participants who indicated they engaged in any combination of the animal abuse items two or more times (adopting the same cut-off as Sanders, Henry, Giuliani, & Dimmer [2013]). With a composite response range between 14 and 98, participants who scored 16 and above were classified as animal abusers<sup>3</sup>. The non-abuser offender group ( $n = 156$ ) consisted of participants who scored less than 16 on the animal abuse measure but indicated “yes” on at least one of the items in the Illegal Behavior Checklist (i.e., response range = 0-20; cut-off score = 1). The non-offender group ( $n = 123$ ) consisted of participants who reported no previous engagement in animal abuse or antisocial behavior.

### **Socio-demographic characteristics and response-related factors**

We asked for participants’ age, gender, and ethnicity. Adverse childhood experiences were assessed using questions from the Conflicts Tactics Scale (Straus & Gelles, 1990). Participants were asked “Did a parent or other adult in the household” followed by a series of eight items measuring psychological (two items), physical (two items), and sexual abuse (four items) with the opportunities to respond yes or no. Three additional items were devised for this study assessing childhood experiences of domestic violence (i.e. “witness your parents/guardians get into physical fights?”), and vicarious experiences of legal animal killing [i.e., “witness anyone (family, friends, etc.) intentionally cause harm to an animal for hunting purposes, for food, or to relieve the animal of pain or suffering?”] and illegal animal killing [i.e., “witness anyone (family, friends, etc.) intentionally cause harm to an animal (not

---

<sup>3</sup> Frequency and/or severity were not part of the initial research aims and, in practice, the decision to work with an offender involves little consideration for the frequency. Rather, clinicians consider frequency and severity to inform the implementation of care planning.

including the killing of an animal during hunting, for food, or to relieve the animal of pain or suffering)?"]. Each of these items were treated as separate variables, so participants who responded yes to any of the three additional items were categorized as having experienced family violence, witnessed legal animal killings, and/or witnessed illegal animal killings.

We also assessed impression management using the subscale from the Paulhus Deception Scales (Paulhus, 1998) so we could control for the effects of socially desirable responding if needed ( $\alpha = .84$ ).

### **Dependent variables**

**Psychological factors.** We administered a series of measures that assessed dynamic psychological characteristics across three domains: empathy, self-concept constructs, and self-/emotion regulation.

Empathy was measured using two Emotional Toughness Scales (Gupta & Beach, 2002): human-oriented (e.g., "Seeing someone in pain doesn't bother me too much") and animal-oriented (e.g., "If I see an animal in pain, it doesn't bother me too much"). These scales assessed callous personality traits. Each scale consisted of 10 items and participants were asked to respond on a 7-point Likert-type scale indicating agreement or disagreement with the statements. With our data, we found good internal reliability (both human- and animal-directed empathy,  $\alpha s = .73$ ).

We examined self-esteem and locus of control as constructs involving self appraisal (i.e., self-concept constructs). Self-esteem was assessed using the 10 item Rosenberg (1965) Self-Esteem Scale. Participants were asked for agreement or disagreement (on a 5-point Likert-type scale) to statements such as "At times, I think I am no good at all", and we found the scale to have excellent internal reliability ( $\alpha = .90$ ). Locus of control was assessed using the 20 item Pettijohn, Pettijohn, and Sacco (2005) scale. Participants were asked to respond true/false to statements such as "The success I have is largely a matter of chance." A

composite measure was computed by summing all of the items whereby a higher score on this scale indicated a more internal locus of control. The Cronbach's alpha coefficient for this scale was low but still within adequate parameters ( $\alpha = .58$ ).

Finally, self-/emotion regulation was assessed using two measures: the Barratt Impulsiveness Scale (Patton, Stanford, & Barratt, 1995) and the Aggression Questionnaire (Buss & Perry, 1992). The Barratt Impulsiveness Scale consists of 30 items and assesses impulsivity across three domains: attentional (e.g., "I am restless at the theatre or lectures"), motor (e.g., "I do things without thinking"), and nonplanning (e.g., "I am more interested in the present than the future"). Participants respond to a 4-point Likert-type scale indicating how often they may act in the statements (i.e., rarely/never, occasionally, often, and almost always/always), and our data demonstrated that the scale was highly reliable ( $\alpha = .88$ ). The Aggression Questionnaire consists of 29 items and asks participants to indicate how "characteristic" each statement is of them on a 7-point Likert-type scale. Items comprise four subscales including: physical aggression (e.g., "I get into fights a little more than the average person"), verbal aggression (e.g., "When people annoy me, I may tell them what I think of them"), anger regulation (e.g., "I have trouble controlling my temper"), and hostility (e.g., "I am suspicious of overly friendly strangers"). The composite Cronbach's alpha coefficient was very good ( $\alpha = .92$ ).

## **Procedure**

Prior to commencing data collection, approval was sought and achieved from the University's Ethics Committee. Participants were recruited via MTurk to complete an online survey consisting of the questionnaires outlined above. The study aim was described as an investigation into the general public's attitudes towards human interactions with animals. Once participants indicated their consent online, they were first given the socio-demographic and response-related measures to complete, followed by the behavioral and psychological

measures that were randomized to control for order effects. Upon completion of the questionnaires, participants were debriefed and informed that the study assessed their social, behavioral, and psychological characteristics, and how these related to their attitudes and behavior towards animals. Participants were then given a unique code that they used to receive payment (\$1.00USD).

## **Results**

We entered the data into IBM SPSS Statistics Version 23 where all of the analyses were conducted using a  $p < .05$  level of significance.

### **Bivariate Analyses**

We conducted oneway analysis of variances (ANOVAs) to see whether the socio-demographic characteristics and response-related variables (i.e., impression management) varied as a function of the independent variable (i.e., animal abuser, non-abuser offender and non-offender; see Table 1 for means, standard deviations, F statistics, and effect sizes). The results showed some expected differences between animal abusers and non-offenders across child psychological abuse and physical abuse, but unexpectedly, not sexual abuse. The results also showed that animal abusers were more likely to report experiences of witnessing someone harm an animal legally (i.e., for hunting purposes, food, and/or euthanasia) during childhood than non-abuser offenders. The animal abuser and non-abuse offender groups both differed from the offender group on impression management.

### **Group Comparisons on Empathy, Self-Concept, and Self-/Emotion-Regulation Factors**

Next, we conducted a MANCOVA to see whether the dependent variables (i.e., empathy, self-concept constructs, and self-/emotion-regulation factors) varied as a function of the independent variable (animal abuser, non-abuser offender, and non-offender groups) within the same model (see Table 2 for means, standard deviations, F statistics, and effect sizes) with impression management as a covariate. We found an overall significant model

( $F(11, 370) = 2.39, p < .001, A = .87, \eta_p^2 = .07$ ). When examining the univariate analyses within the model we found the following: significant effects for (1) emotional toughness – animal-oriented, (2) self-esteem, (3) locus of control (marginal), (4) nonplanning subscale of the BIS, and (5) physical aggression, (6) anger regulation, and (7) hostility subscales of the Aggression Questionnaire. Animal abusers scored significantly lower on self-esteem and locus of control (indicating a more external locus of control) than non-abuser offenders, and they scored higher than non-abuser offenders on measures assessing emotional toughness towards animals, nonplanning deficits, physical aggression, anger regulation, and hostility. All of these indicated more problematic responding for animal abusers. There were no significant differences between the groups on emotional toughness towards humans, the attentional and motor subscales of the BIS, and the verbal aggression subscale of the Aggression Questionnaire.

### **Multinomial Logistic Regression**

Given the significant variables that arose from the ANOVA and MANCOVA, we conducted a multinomial logistic regression (controlling for the significant socio-demographic and response related factors) to see which of the variables (i.e., emotional toughness towards animals, self-esteem, locus of control, nonplanning impulsivity, physical aggression, anger regulation, and hostility) were the strongest predictors of animal abuse perpetration. The overall model was significant (see Table 3 for regression statistics). Emotional toughness towards animals and self-esteem were significant predictors of animal abuse perpetration when compared to non-abuser offenders, whereby higher endorsements of emotional toughness towards animals and low self-esteem predicted whether participants engaged in animal abuse.

### **Moderation and Mediation Pathway Analyses**

To better understand the processes that distinguished whether someone would perpetrate animal abuse or other types of offences, we created a dichotomous outcome variable (animal abuser and non-abuse offender groups). We proposed that past vicarious experiences of animal harm/killing would theoretically desensitize a person to the thoughts and feelings of the animal itself (i.e., empathy deficits). We argued that emotional toughness towards animals would mediate (at least partially) the relationship between witnessing animal harm/killing (legally) and animal abuse perpetration during adulthood, more so than self-esteem. Further, empathy deficits alone did not appear to fully explain why people might perpetrate animal abuse as opposed to other types of offending. We revised our original model and proposed that emotion regulation would be a likely exacerbating, or rather, moderating factor (Model 4 using the PROCESS macro for SPSS; Hayes, 2013). The model we examined (see Figure 1) depicts both a mediator pathway (emotional toughness towards animals as mediator) and a moderator pathway (anger regulation as moderator). Our data fit this model. We found that the witnessing animal killing – animal abuse perpetration relationship was explained by emotional toughness towards animals, and the relationship was, indeed, stronger amongst participants who self-reported more problems with anger regulation.

### **Discussion**

Given that animal abusers appear to be generally antisocial individuals, we wanted to see if specific static and dynamic factors could distinguish animal abusers from other types of offenders as well as non-offenders. We had partial support for Hypothesis 1 whereby animal abusers were more likely to self-report witnessing legal killings of animals during childhood than non-abuser offenders. Consistent with Hypothesis 2, we did find animal abusers to be distinguished from non-abuser offenders across facets of empathy (animal-oriented), self-concept (self-esteem and locus of control), and self-/emotion-regulation (non-planning



impulsivity, physical aggression, and anger regulation and hostility). Further, when controlling for the other variables (i.e., socio-demographic and response-related variables), we found animal-oriented empathy and self-esteem to be the most important distinguishing features whereby animal abusers showed less animal empathy and lower self-esteem than non-abuser offenders. Hypothesis 3 was also partially supported. We found that the mediated relationship between witnessing legal animal killing during childhood and animal abuse perpetration during adulthood (animal empathy as mediator) was stronger amongst participants with anger regulation issues.

Our study re-affirms some past theoretical and empirical research but also adds to the existing literature that has been unidimensional in approach. We first predicted that animal abusers would share similar demographic characteristics and childhood adversities to other types of offenders (i.e., individuals who self-reported engagement in antisocial behavior but never animal abuse); what would distinguish animal abusers would be past exposure to animal killing. Our findings did indeed show that animal abusers and non-abuser offenders were similar in age, gender, and ethnicity, and they had similar adverse experiences during childhood compared to other offenders. Where the two groups differed was in their exposure to legal (not illegal) killing of animals. Although we had also expected that animal abusers would have also witnessed illegal forms of animal killing (and/or other forms of abuse), this partial support for our first hypothesis still fits with our wider premise. That is, animal abusers have childhood experiences that specifically desensitized them to the feelings of animals. This distinction is important from a practitioner perspective when working with animal abusers in correctional or probation settings amongst other offenders who share similar risk factors. In such situations, there needs to be an indication of what practitioners should focus on in addition to what is commonly addressed (i.e., childhood adverse

experiences such as verbal/psychological abuse that animal abusers have previously reported; Vaughn et al., 2011).

Our study also extends existing literature by showing animal-oriented empathy to be more important in distinguishing animal abusers from non-abuser offenders. This is particularly interesting from a theoretical standpoint because it can explain why some people choose to harm animals rather than people (e.g., in the context of intimate partner violence). This finding, in conjunction with low self-esteem, suggests that animal abusers who feel threatened and low in self-worth are trying to enhance their relational value by aggressing against others they know cannot effectively fight back (demonstrating dominance) and against others whom they perceive cannot experience harm or pain (as indicated in Gupta's [2008] study). These findings are also interesting because future research could explore broader animal-specific constructs such as theory of mind, i.e., a person's understanding of others' mental states, and that these mental states explain behavior (e.g., Astington, Harris, & Olson, 1988). Specifically, the questions are: (1) are animal abusers limited to their lack of understanding of the emotional state of animals alone, or do they lack understanding of animals as sentient beings more broadly? (2) what are the implications for research and practice if the latter is the case?

Our study combined what is unique about animal abusers and what we know about offenders more broadly. It was too simplistic to predict that animal-oriented empathy alone played a facilitative role in the perpetration of animal abuse. Like other types of aggressive individuals (Howell et al., 1997; Garofalo et al., 2016), animal abusers also have anger regulation issues. Thus, our finding that the witnessing animal killing – animal abuse perpetration relationship (mediated by low animal empathy) was strongest amongst those who struggle to manage their anger is evidence for the complexities in the psychological vulnerabilities of animal abusers. Again, referring back to the intimate partner violence

literature, perpetrators are expressing their anger/rage (Adams, 1995) by harming animals (because they lack empathy) as a form of emotion dysregulation. However, this conclusion needs to be explored more explicitly in terms of type of and motivation for animal abuse to see if it still holds. For example, do these processes remain significant for the perpetration of animal neglect or hoarding?

### **Limitations**

This study has its limitations. Our study is cross-sectional, and thus, retrospective in design. We cannot draw conclusions on cause and effect without a longitudinal or experimental research design. However, given this limitation, our study gives an indication of the types of background factors to explore in future research.

The self-report nature of our study also poses another potential limitation for two reasons. First, our participants could have responded with a social desirability bias given that we were asking about their offending behavior. We did administer an impression management scale that we controlled for in our multivariate analyses because it was significant in our preliminary analyses. However, the animal abuser and non-abuser offender groups did not differ on this scale, which was a likely consequence of both groups self-reporting antisocial behavior. So, there is no surprise that we did not see differences between groups; thus we may be presenting an under-representation of the behavior and associated variables. We also concede that using MTurk to recruit participants may have biased our data. Although MTurk samples are deemed similar to undergraduate samples, they are moderately dissimilar to clinical samples (Miller et al., 2017). However, the conviction rates for animal abuse are very low (approximately 1.5%; Royal Society for the Prevention of Cruelty to Animals, 2015), so it can be argued that many animal abusers are undetected. Recruiting a community sample gives us the opportunity to capture the wider range of animal abuse cases, rather than limiting the study to the more severe cases.

Second, our data are potentially at the risk of common method variance whereby participants may have responded in a repetitive and consistent way given the nature (i.e., Likert-type) and number of the items presented to them. However, the literature in this field is scant, and this method offers us an opportunity to explore perceptual and experiential constructs (Chan, 2009) even if only in a preliminary way.

### **Conclusions**

Despite the above limitations, this study is the first to explore how static and dynamic factors distinguish animal abusers from other types of antisocial individuals. There is a clear indication that empathy is a significant factor, and specifically, animal-oriented empathy. We do need to investigate further how this psychological vulnerability develops and under which circumstances it manifests itself as problematic behavior. Our study provides some clarity in this whereby specific types of childhood experiences play a part, and how people regulate their emotions may act as an exacerbating factor in a given situation. It might be worth researching whether actual and/or vicarious experiences of animal abuse could be an additional adverse childhood experience, whereby exposure to animal abuse during childhood contributes to the cumulative risk of poor social, psychological, and behavioral outcomes in adulthood. Further exploration of how self-esteem may play a role is also needed. Given that the literature suggests a dynamic relationship between self-esteem and aggressive behavior more broadly, our cross-sectional, correlational data cannot speak to this directly. Thus, our study offers a preliminary understanding of the relationships between background experiences and the perpetration of animal abuse in addition to other types of offending.

## References

- Adams, C. (1995). Woman-battering and harm to animals. In Adams, C. & Donovan, J. (eds.), *Animals and women: Feminist theoretical explorations*. Duke University Press: Durham, N.C.
- Agnew, R. (1998). The causes of animal abuse: A social-psychological analysis. *Theoretical Criminology*, 2, 177-209. doi: 10.1177/1362480698002002003
- Allen, M., Gallagher, B., & Jones, B. (2006). Domestic violence and the abuse of pets: Researching the link and its implications in Ireland. *Practice: Social work in action*, 18, 167-181. doi:10.1080/09503150600904060
- Alleyne, E., & Parfitt, C. (in press). Adult-perpetrated animal abuse: A systematic literature review. *Trauma, Violence, and Abuse*. doi: 10.1177/1524838017708785
- Alleyne, E., Tilston, L., Parfitt, C., & Butcher, R. (2015). Adult-perpetrated animal abuse: Development of a proclivity scale. *Psychology, Crime, and Law*, 21, 570-588. doi:10.1080/1068316X.2014.999064
- Arluke, A., Levin, J., Luke, C., & Ascione, F. (1999). The relationship of animal abuse to violence and other forms of antisocial behavior. *Journal of Interpersonal Violence*, 14, 963-975. doi:10.1177/088626099014009004
- Ascione, F. R. (1993). Children who are cruel to animals: A review of research and implications for developmental psychopathology. *Anthrozoos*, 6, 226-247. doi:10.2752/089279393787002105
- Ascione, F. R. (2005) Children, animal abuse and family violence – The multiple intersection of animal abuse, child victimization and domestic violence. In K. A. Kendall-Tackett & S. M. Giacconi (Eds.), *Child victimization: Maltreatment, bullying and dating*

violence; prevention and intervention (pp. 3.1-3.36). Kingston, NJ: Civic Research Institute Inc.

Astington, J. W., Harris, P. L., & Olson, D. R. (1988). *Developing theories of mind*.

Cambridge: Cambridge University Press.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, 50, 248-287. doi:10.1016/0749-5978(91)90022-L

Bandura, A. (2002). Selective moral disengagement in the exercise of moral agency. *Journal of Moral Education*, 31, 101-119. doi: 10.1080/0305724022014322

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Mechanisms of moral disengagement in the exercise of moral agency. *Journal of Personality and Social Psychology*, 71, 364-374. doi: 10.1037/0022-3514.71.2.364

Bushman, B. J., Baumeister, R. F., Thomaes, S., Ryu, E., Begeer, S., & West, S. G. (2009).

Looking again, and harder, for a link between low self-esteem and aggression.

*Journal of Personality*, 77, 427-446. doi: 10.1111/j.1467-6494.2008.00553.x

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high quality, data? *Perspectives on Psychological Science*, 6, 3-5. doi: 10.1177/1745691610393980

Buss, A. H., & Perry, M. P. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology*, 63, 452-459.

Carlisle-Frank, P., Frank, J. M., & Nielsen, L. (2004). Selective battering of the family pet. *Anthrozoös*, 17, 26-42. doi:10.2752/089279304786991864

Casler, K., Bickel, L., & Hackett, E. (2013). Separate but equal? A comparison of participants and data gathered via Amazon's MTurk, social media, and face-to-face behavioral testing. *Computers in Human Behavior*, 29, 2156-2160. doi: 10.1016/j.chb.2013.05.009

- Chan, D. (2009). So why ask me?—Are self-report data really that bad? In C. E. Lance & R. J. Vandenberg (Eds.), *Statistical and methodological myths and urban legends: Received doctrine, verity, and fable in the organizational and social sciences* (pp. 309-336). East Sussex, UK: Taylor & Francis Group.
- Cohen, D., & Strayer, J. (1996). Empathy in conduct-disordered and comparison youth. *Developmental Psychology*, 32, 988-998. Doi: 10.1037/0012-1649.32.6.988
- Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., Moffitt, T. E., & Caspi, A. (2005). Low self-esteem is related to aggression, antisocial behavior, and delinquency. *Psychological Science*, 16, 328-335. Doi: 10.1111/j.0956-7976.2005.01535.x
- Elliott, I. A. (2017). A self-regulation model of sexual grooming. *Trauma, Violence, and Abuse*, 18, 83-97. Doi: 10.1177/1524838015591573
- Erlanger, A., & Tsytsarev, S. V. (2012). The relationship between empathy and personality in undergraduate students' attitudes toward nonhuman animals. *Society and Animals: Journal of Human-Animal Studies*, 20, 21-38. doi:10.1163/156853012X614341
- Faver, C. A., & Strand, E. B. (2003). Domestic violence and animal cruelty: Untangling the web of abuse. *Journal of Social Work Education*, 39, 237-253. Doi: 10.1080/10437797.2003.10779134
- Fiske, S. T., & Taylor, S. E. (2013). *Social cognition: From brains to culture*. London, UK: Sage Publications Ltd.
- Flynn, C. P. (2000a). Battered women and their animal companions: Symbolic interaction between human and nonhuman animals. *Society and Animals: Journal of Human-Animal Studies*, 8, 99-127. doi:10.1163/156853000511032

- Flynn, C. P. (2000b). Woman's best friend: Pet abuse and the role of companion animals in the lives of battered women. *Violence Against Women*, 6, 162-177.  
doi:10.1177/10778010022181778
- Garofalo, C., Holden, C. J., Zeigler-Hill, V., & Velotti, P. (2016). Understanding the connection between self-esteem and aggression: The mediating role of emotion dysregulation. *Aggressive Behavior*, 42, 3-15. doi: 10.1002/ab.21601
- Green, G. S. (2002). The other criminalities of animal freeze-killers: Support for a generality of deviance. *Society and Animals: Journal of Human-Animal Studies*, 10, 5-30. doi: 10.1163/156853002760030851
- Gupta, M. (2008). Functional links between intimate partner violence and animal abuse: Personality features and representations of aggression. *Society and Animals: Journal of Human-Animal Studies*, 16, 223-242. doi:10.1163/156853008X323385
- Gupta, M., & Beach, S. R. H. (2001). Aggression toward animals scale. Unpublished scale. Athens, Georgia, USA: University of Georgia.
- Gupta, M., & Beach, S. R. H. (2002). Emotional toughness toward animals scale. Unpublished scale. Athens, Georgia, USA: University of Georgia.
- Hackett, S., & Uprichard, E. (October, 2007). Animal abuse and child maltreatment: A review of the literature and findings from a UK study. London, UK: NSPCC.
- Haslam, N. (2006). Dehumanization: An integrative review. *Personality and Social Psychology Review*, 10, 252-264. doi: 10.1207/s15327957pspr1003\_4
- Hayes, A. F. (2013). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. New York, NY: The Guilford Press.



- Henry, B. C. (2004a). Exposure to animal abuse and group context: Two factors affecting participation in animal abuse. *Anthrozoös*, 17, 290-305. doi: 10.2752/089279304785643195
- Henry, B. C. (2004b). The relationship between animal cruelty, delinquency, and attitudes toward the treatment of animals. *Society and Animals: Journal of Human-Animal Studies*, 12, 185-207. doi: 10.1163/1568530042880677
- Henry, B. C. (2006). Empathy, home environment, and attitudes toward animals in relation to animal abuse. *Anthrozoos*, 19, 17-34. doi: 10.2752/089279306785593847
- Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-analysis. *Aggression and Violent Behavior*, 9, 441-476. doi: 10.1016/j.avb.2003.03.001
- Leary, M. R., & Guadagno, J. (2011). The sociometer, self-esteem, and the regulation of interpersonal behavior. In K.D. Vohs and R.F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (2<sup>nd</sup> Edition) (pp. 339-354). New York, NY, USA: The Guilford Press.
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, 44, 1-23. Doi: 10.3758/s13428-011-0124-6
- McCoy, K., Fremouw, W., Tyner, E., Clegg, C., Johansson-Love, J., & Strunk, J. (2006). Criminal-thinking styles and illegal behavior among college students: Validation of the PICTS. *Journal of Forensic Sciences*, 51, 1174-1177. doi:10.1111/j.1556-4029.2006.00216.x
- Merz-Perez, L., & Heide, K. M. (2004). *Animal cruelty: Pathway to violence against people*. Walnut Creek, CA: AltaMira Press.
- Miller, J. D., Crowe, M., Weiss, B., Maples-Keller, J. L., & Lynam, D. R. (2017). Using online, crowdsourcing platforms for data collection in personality disorder research:

The example of Amazon's Mechanical Turk. *Personality Disorders: Theory, Research, and Treatment*, 8, 26-34. doi: 10.1037/per0000191

Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology*, 51, 768-774. Doi: 10.1002/1097-4679(199511)51:6<768::AID-JCLP2270510607>3.0.CO;2-1

Paulhus, D. L. (1998) *Manual for the Paulhus Deception Scales: BIDR Version 7*. Toronto, Canada: Multi-Health Systems.

Pettijohn, T. F., 2<sup>nd</sup>, Pettijohn, T. F., & Sacco, D. F. (2005). A locus of control measure as a teaching demonstration. *Psychological Reports*, 97, 666-666. Doi: 10.2466/pr0.97.2.666-666

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.

Royal Society for the Prevention of Cruelty to Animals. (2015). *Trustees' Report and Accounts 201*. Retrieved from <https://view.pagetiger.com/RSPCATrusteesReportandAccounts2015/issue1>

Sanders, C. E., Henry, B. C., Giuliani, C. N., & Dimmer, L. N. (2013). Bullies, victims, and animal abusers: Do they exhibit similar behavioral difficulties? *Society and Animals*, 21, 225-239. Doi: 10.1163/15685306-12341285

Schwartz, R. L., Fremouw, W., Schenk, A., & Ragatz, L. L. (2012). Psychological profile of male and female animal abusers. *Journal of Interpersonal Violence*, 27, 846-861. Doi: 10.1177/0886260511423254

Straus, M., & Gelles, R. J. (1990). *Physical violence in American families: Risk factors and adaptations to violence in 8,145 families*. New Brunswick: Transaction Press.

- Vaughn, M. G., Fu, Q., Beaver, K. M., DeLisi, M., Perron, B. E., & Howard, M. O. (2011). Effects of childhood adversity on bullying and cruelty to animals in the United States: Findings from a national sample. *Journal of Interpersonal Violence*, 26, 3509-3525. doi:10.1177/0886260511403763
- Vaughn, M. G., Fu, Q., DeLisi, M., Beaver, K. M., Perron, B. E., Terrell, K., & Howard, M. O. (2009). Correlates of cruelty to animals in the United States: Results from the national epidemiologic survey on alcohol and related conditions. *Journal of Psychiatric Research*, 43, 1213-1218. doi:10.1016/j.jpsychires.2009.04.011
- Walters, G. D. (2013). Testing the specificity postulate of the Violence Graduation Hypothesis: Meta-analyses of the animal cruelty-offending relationship. *Aggression and Violent Behavior*, 18, 797-802. doi:10.1016/j.avb.2013.10.002
- Wright, J., & Hensley, C. (2003). From animal cruelty to serial murder: Applying the graduation hypothesis. *International Journal of Offender Therapy and Comparative Criminology*, 47, 71-88. doi:10.1177/0306624X02239276
- Zeigler-Hill, V., Dahlen, E. R., & Madson, M. B. (2017). Self-esteem and alcohol use: Implications for aggressive behavior. *International Journal of Mental Health Addiction*, 15, 1103-1117. Doi: 10.1007/s11469-017-9764-9

Table 1. Bivariate Relationships between Animal Abuse Perpetration and Sociodemographic Characteristics

Variable	Response Range	Animal Abuser M (SD) (n = 105)	Non-Abuser Offender M (SD) (n = 156)	Non-Offender M (SD) (n = 123)	F	df	p	$\omega$
Age (Years)	19 – 71	37.92 (11.45)	36.94 (10.66)	36.99 (11.88)	.28	2, 381	.757	.03
Gender	1 – 2	1.45 (.50)	1.45 (.50)	1.56 (.50)	1.93	2, 377	.146	.09
Ethnicity	0 – 1	.87 (.34)	.83 (.38)	.82 (.38)	.50	2, 381	.605	.004
Family Violence	1 – 2	1.26 (.44)	1.21 (.41)	1.17 (.38)	1.29	2, 381	.277	.06
Child Psychological Abuse	2 – 4	2.58 <sub>a</sub> (.78)	2.46 <sub>ab</sub> (.74)	2.33 <sub>b</sub> (.62)	3.40	2, 381	.034	.12
Child Physical Abuse	4 – 8	4.95 <sub>a</sub> (1.35)	4.68 <sub>ab</sub> (1.19)	4.47 <sub>b</sub> (.98)	4.74	2, 381	.009	.15
Child Sexual Abuse	4 – 8	4.44 (1.09)	4.41 (1.11)	4.19 (.69)	2.38	2, 381	.094	.10
Witness Illegal Animal Harm/Killing	1 – 2	1.19 <sub>a</sub> (.40)	1.12 <sub>ab</sub> (.33)	1.03 <sub>b</sub> (.18)	7.46	2, 381	.001	.19
Witness Legal Animal Harm/Killing	1 – 2	1.43 <sub>a</sub> (.50)	1.28 <sub>b</sub> (.45)	1.14 <sub>c</sub> (.35)	12.67	2, 381	<.001	.24
Impression Management	0 – 20	7.50 <sub>a</sub> (4.39)	7.65 <sub>a</sub> (4.31)	10.94 <sub>b</sub> (4.33)	24.91	2, 381	<.001	.34

Means that do not share subscripts differ at  $p < .05$ .

Table 2. Group Comparisons on Psychological Characteristics

Measures	Animal Abusers n = 105			Non-Abuser Offender n = 156			Non-Offender n = 123			F	p	$\eta^2_p$
	M	SD	95% CI	M	SD	95% CI	M	SD	95% CI			
Empathy												
Emotional Toughness towards Humans	11.81	.47	10.89, 12.74	10.68	.39	9.92, 11.44	11.75	.45	10.87, 12.63	2.40	.092	.01
Emotional Toughness towards Animals	10.88 <sub>a</sub>	.44	10.01, 11.75	8.67 <sub>b</sub>	.36	7.95, 9.38	10.53 <sub>a</sub>	.42	9.70, 11.36	9.38	<.001	.05
Self-/Other Appraisals												
Self-esteem	37.67 <sub>a</sub>	.85	35.99, 39.34	41.74 <sub>b</sub>	.70	40.36, 43.11	38.61 <sub>a</sub>	.81	37.01, 40.21	8.09	<.001	.04
Locus of Control	64.64 <sub>a</sub>	1.31	62.07, 67.20	68.29 <sub>b</sub>	1.07	66.18, 70.40	65.16 <sub>ab</sub>	1.25	62.71, 67.61	2.98	.052	.02
Self-/Emotion Regulation												
Barratt Impulsiveness Scale												
Attentional	15.19	.36	14.47, 15.90	14.17	.30	13.58, 14.75	14.64	.35	13.96, 15.32	2.41	.091	.01
Motor	20.92	.39	20.15, 21.68	19.97	.32	19.34, 20.60	20.16	.37	19.43, 20.90	1.86	.157	.01
Nonplanning	23.35 <sub>a</sub>	.47	22.43, 24.26	21.86 <sub>b</sub>	.38	21.11, 22.61	23.79 <sub>a</sub>	.44	22.91, 24.66	6.08	.003	.03
Aggression Questionnaire												
Physical Aggression	26.24 <sub>a</sub>	.80	24.67, 27.81	23.34 <sub>b</sub>	.66	22.05, 24.63	23.44 <sub>b</sub>	.76	21.94, 24.94	4.62	.010	.02
Verbal Aggression	17.84	.55	16.77, 18.91	16.80	.45	15.92, 17.68	16.98	.52	15.96, 18.00	1.18	.310	.01
Anger	22.22 <sub>a</sub>	.62	21.00, 23.44	19.61 <sub>b</sub>	.51	18.61, 20.62	19.81 <sub>b</sub>	.59	18.64, 20.98	6.01	.003	.03
Hostility	26.94 <sub>a</sub>	1.00	24.97, 28.91	23.81 <sub>b</sub>	.82	22.19, 25.43	23.61 <sub>b</sub>	.96	21.73, 25.49	3.72	.025	.02

The univariate analyses presented in the table are derived from an overall significant model.

Means adjusted for impression management.

Means that do not share subscripts differ at  $p < .05$ .

Table 3. Multinomial logistic regression with animal abuser group as reference category (n = 105)

Measures	Odds Ratio (95% CI)		
	Wald $\chi^2$	Non-Abuser Offender (n = 156)	Non-Offender (n = 123)
Impression Management	34.21***	.94 (.87, 1.01)	1.15** (1.06, 1.25)
Witness Illegal Forms of Animal Harm/Killing	5.14	.76 (.35, 1.68)	.28* (.08, .92)
Witness Legal Forms of Animal Harm/Killing	11.37**	.63 (.35, 1.12)	.31** (.15, .62)
Child Psychological Abuse	2.04	1.79 (.63, 5.08)	2.35 (.65, 8.53)
Child Physical Abuse	2.96	.68 (.36, 1.27)	.52 (.23, 1.16)
Emotional Toughness Towards Animals	11.91**	.91** (.85, .97)	1.00 (.94, 1.06)
Self-esteem	7.21*	1.05* (1.01, 1.09)	1.01 (.97, 1.05)
Locus of Control	.96	1.00 (.98, 1.02)	.99 (.96, 1.01)
BIS – Nonplanning	2.01	.99 (.93, 1.05)	1.03 (.96, 1.11)
AQ – Physical Aggression	.55	1.00 (.96, 1.04)	.98 (.94, 1.03)
AQ – Anger Regulation	2.81	.96 (.91, 1.01)	.97 (.91, 1.03)
AQ – Hostility	2.05	1.01 (.97, 1.05)	.98 (.94, 1.02)

\*p < .05. \*\*p < .01. \*\*\*p < .001. Model statistics:  $\chi^2$  (24) = 119.57, p < .001, R<sup>2</sup> = .27 (Cox and Snell), .30 (Nagelkerke).

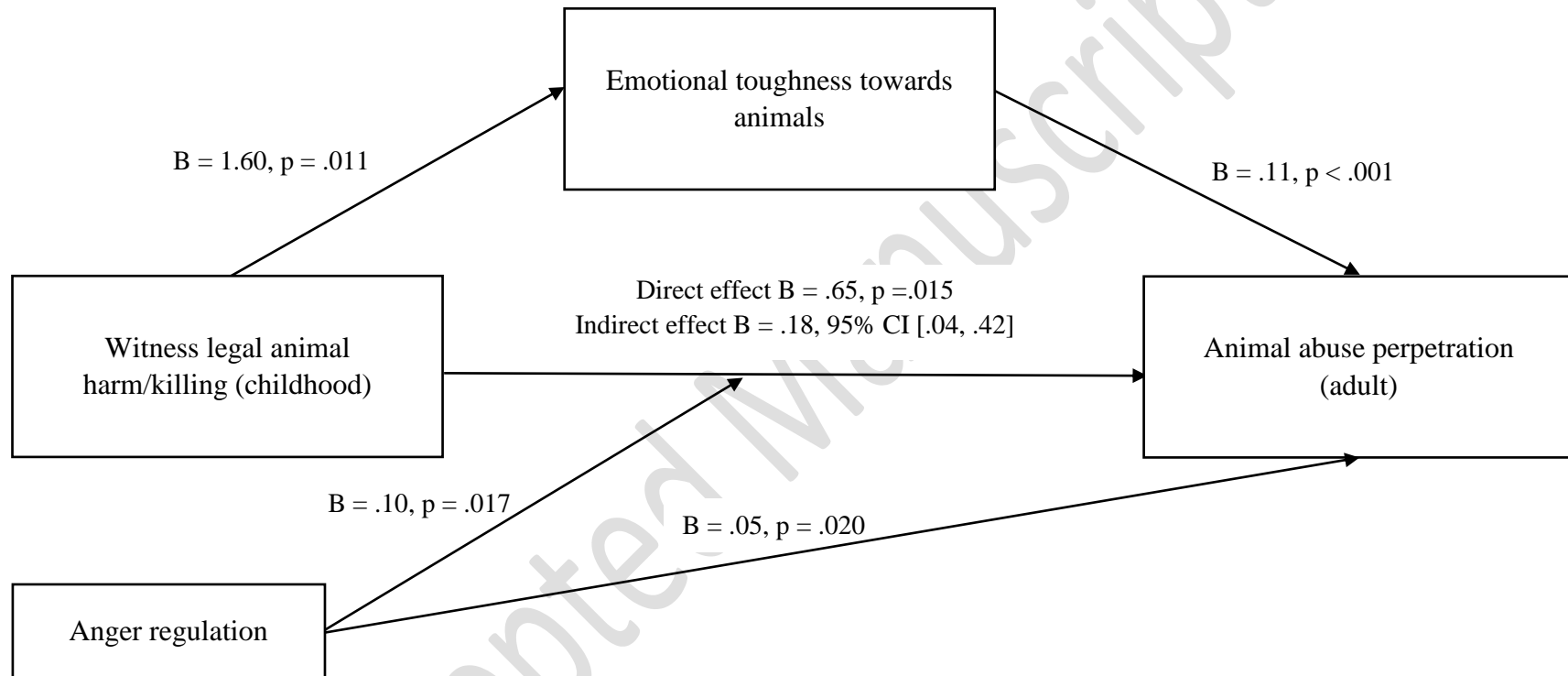


Figure 1. Conceptual depiction of the moderation and mediation model.